# CORNERSTONES FOR THE SPECIAL NUCLEAR MATERIAL SAFEGUARDS AND CLASSIFIED INFORMATION AND MATERIAL SAFEGUARDS PERFORMANCE AREAS

The final draft cornerstone descriptions for the Special Nuclear Material Safeguards and Classified Information and Material Safeguards performance areas are attached. They were developed from the best available information that has been supplied by NRC stakeholders, both internal and external, over the course of the fuel cycle oversight revision project. They have been formulated to capture, at a high level, the fundamental elements of each cornerstone. When stakeholder consensus on these cornerstones has been reached, they will be included in the coming revisions to NRC Inspection Manual Chapters 2600 (Fuel Cycle Facility Operational Safety and Safeguards Inspection Program) and 2604 (Licensee Performance Review), along with the cornerstones that have already been developed for the Facility Operations Safety and Nuclear Hazard Related Safety performance areas.

Castleman; 6/21/2001

# DRAFT -- 6/21/2001

## PERFORMANCE AREA: SPECIAL NUCLEAR MATERIAL SAFEGUARDS

## CORNERSTONE: INITIATING EVENTS

| **Cornerstone** | ***Initiating Events*** |
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| **General Description** | This cornerstone is designed to monitor the licensee's performance in preventing and deterring attempts at radiological sabotage or the loss, theft, or diversion of special nuclear material. External threats may be dissuaded by projecting an appearance of a reliable and capable safeguards programs, by protecting information that could be exploited by an attacker, and by management measures to support the safeguards program and to publicize its effectiveness. Initiation of internal threats can be minimized by ensuring that employees with access to vital equipment or to special nuclear material, and those employees that perform safeguards program functions, are adequately screened and assessed to ensure that they are reliable and trustworthy. Internal threats of theft or diversion can be further deterred by material control and accounting that is capable of effectively discovering an event in a timely manner. |
| **Objective and Scope** | To minimize initiating events that could result in radiological sabotage or the loss, theft, or diversion of special nuclear material. |
| **Key Attributes** | • **human performance:** human errors can cause initiating events during plant operations and maintenance (including calibration, surveillance testing and plant modifications).<br>• **equipment performance:** failure or degradation of site structures, systems, equipment and components can constitute an initiating event. The capability, availability and reliability of safeguards equipment can be assured by sound preventive and corrective maintenance programs.<br>• **management measures:** effective management measures (e.g., operating and maintenance procedures and programs, configuration control, employee training and qualification, pre-employment screening, behavioral observation, audits and assessments) can minimize the frequency of initiating events.<br>• **material control and accounting (MC&A) performance:** effective MC&A, including equipment, programs/procedures, and implementation, is a deterrent to initiating events in this cornerstone.<br>• **physical protection performance:** effective physical protection, including equipment, programs/procedures, and implementation, is a deterrent to initiating events in this cornerstone. |
| **Items to Measure** | • **human performance:** human errors that cause initiating events can be measured by reviewing actuations of safeguards equipment and off-normal plant conditions.<br>• **equipment performance:** equipment failures that constitute initiating events can also be measured by reviewing actuations of safeguards equipment and off-normal plant conditions. Risk-informed inspections may be performed to check for possible degradation of engineered controls.<br>• **management measures:** management measures can best be measured by risk-informed inspections of procedures, corrective action programs, worker training and qualification programs, reporting mechanisms and other management oversight processes.<br>• **material control and accounting (MC&A) performance:** MC&A effectiveness as a deterrent to initiating events can be measured by a combination of inspections and suitable performance indicators.<br>• **physical protection performance:** physical protection effectiveness as a deterrent to initiating events can be measured by a combination of inspections and suitable performance indicators. |

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| **Performance Indicators (PIs)** | • **actuation of safeguards controls:** actuations that result from, for example, human errors, equipment failures, design deficiencies, or management measure failures.<br>• **off-normal conditions:** off-normal or abnormal conditions that do not result in actuation of a control (e.g., number of reportable events). |
| **Baseline Inspection Needs** | • **management measures:** technical adequacy of procedures, corrective action program, maintenance records, administrative and engineered controls for safeguards equipment (e.g., availability, reliability, and configuration controls), security organization and adequacy of security plans<br>• **off-normal events:** review of off-normal events, licensee analysis, and corrective actions.<br>• **design deficiencies**<br>• **human performance:** training and qualification records; staff effectiveness in implementing programs and procedures.<br>• **accuracy of reported PI data:** verification of the collection of PI data and that data gathering is in compliance with NRC guidelines. |

# DRAFT -- 6/21/2001

## PERFORMANCE AREA: SPECIAL NUCLEAR MATERIAL SAFEGUARDS

## CORNERSTONE: SYSTEMS AND BARRIERS

| **Cornerstone** | ***Systems and Barriers*** |
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| **General Description** | The objective of this cornerstone is to provide assurance that a licensee's physical protection system and material control and accounting (MC&A) program will protect against radiological sabotage and can detect and assess the threatened or real loss, theft or diversion of special nuclear material. Threats could come from internal or external sources, and licensees can maintain adequate protection against threats through an effective security program that relies on a defense in depth approach. |
| **Objective and Scope** | To assure the operability (capability, availability, and reliability) of items relied on for safeguarding special nuclear material to detect, assess, prevent, and mitigate threatened or real radiological sabotage or the loss, theft or diversion of special nuclear material. |
| **Key Attributes** | • **engineered barriers:** the capability, availability and reliability of systems, equipment and components can be assured through attributes such as proper design and installation, maintenance, modification, calibration, and testing. Systems, equipment and components of interest include: physical barriers; access control systems; detection, surveillance, and alarm systems; and MC&A measurement systems.<br>• **management measures:** sound management measures are important for assuring the capability, availability and reliability of safeguards systems. Management measures of interest include: operating and maintenance procedures, accounting and control procedures, site access controls, maintenance programs, configuration control, employee training and qualifications, and audits and assessments. |
| **Items to Measure** | • **engineered barriers:** availability, capability and reliability of physical protection equipment such as alarms, barriers, material measurement equipment, and access detection and surveillance systems.<br>• **management measures:** areas that can be measured for this cornerstone attribute include training and qualification programs, physical protection procedures, site access controls, MC&A procedures (such as item control and shipment tracking procedures), corrective actions, reporting mechanisms, and human performance in fulfilling responsibilities in the security and MC&A organizations. |
| **Performance Indicators (PIs)** | • **physical protection system:** percent of the time all components of the physical protection system are available and capable of performing their intended functions.<br>• **security force performance:** some quantitative measurement of the performance of security personnel (e.g. ingress/egress control, surveillance, intrusion detection, drill performance, etc.).<br>• **item control:** two components are to be considered: (i) number of items that cannot be accounted for, and (ii) number of items that cannot be accounted for and which are reportable to the NRC.<br>• **measurement control:** accuracy of the measurement system as indicated by the number of times the measurement systems are found to be out of acceptable set calibration ranges.<br>• **missed ETA:** the number of shipments originating at the licensed facility whose Estimated Time of Arrival (ETA) falls outside the permissible time bounds. |

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| **Baseline Inspection Needs** | • **physical protection:** operability and availability of intrusion detection systems, alarms and barriers, performance of access detection and surveillance systems.<br>• **human performance:** training records, correction of training deficiencies, staff effectiveness in implementing programs and procedures.<br>• **management measures:** technical adequacy of procedures, corrective actions, security organization and adequacy of security plans, review of training, site access, fitness for duty.<br>• **accuracy of reported PI data:** verification of the collection of PI data and that data gathering is in compliance with NRC guidelines.<br>• **MC&A program:** review of procedures and (if applicable) HEU nuclear material control plan, written records on licensed material receipt, inventory, disposal and acquisition, fulfillment of program objectives, accuracy of material balance reports and timeliness of filings, measurement systems and controls, achievement of acceptable standard errors of inventory differences, alarm resolution program, and measurement quality assurance program. |

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## PERFORMANCE AREA: SPECIAL NUCLEAR MATERIAL SAFEGUARDS

## CORNERSTONE: CONTINGENCY PREPAREDNESS

| **Cornerstone** | ***Contingency Preparedness*** |
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| **General Description** | This cornerstone is designed to assure that the licensee can implement adequate contingency measures in response to radiological sabotage or the loss, theft, or diversion of special nuclear material. Contingency preparedness incorporates both on-site licensee actions and supporting actions by off-site Federal, State, and local government authorities. |
| **Objective and Scope** | To ensure that the licensee is capable of implementing adequate contingency measures to respond to initiating events in the physical security and MC&A functions. |
| **Key Attributes** | • **response to events:** implementation of a protective strategy in response to an initiating event, including plans to get properly trained response personnel in place within pre-determined times, and implementation of the facility emergency response plan in the event of an associated plant accident.<br>• **human performance:** proper training of plant workers and security personnel to respond to a threat; proficiency in training exercises and real events.<br>• **equipment:** response of safeguards equipment to real or simulated initiating events.<br>• **management measures:** program audits and assessments, law enforcement liaison, employee training and qualification programs. |
| **Items to Measure** | • **response to events:** effectiveness of contingency response plans, readiness to respond to contingencies, protective strategy plan implementation, and event classification and notification.<br>• **human performance:** evaluation of structured drills and exercises.<br>• **equipment:** operability and performance of safeguards response equipment.<br>• **management measures:** oversight of safeguards contingency plan. |
| **Performance Indicators (Pis)** | • **response to events**: success of periodic drills and exercises (e.g., employee participation).<br>• **equipment:** availability of contingency response equipment.<br>• **organization drill participation**: participation of security organization. personnel in periodic drills and exercises and in actual events. |
| **Baseline Inspection Needs** | • **response to events:** protective strategy plan implementation, review of training and qualification records, protective strategy, drill and exercise scenarios, drill critiques, etc.<br>• **management measures:** safeguards contingency plan, review of corrective action program and implementation of recommended actions.<br>• **human performance:** fulfillment of responsibilities in the event of a theft, loss or diversion.<br>• **accuracy of reported PI data:** verification of the collection of PI data and that data gathering is in compliance with NRC guidelines. |

# DRAFT -- 6/21/2001

## PERFORMANCE AREA: CLASSIFIED INFORMATION AND MATERIAL SAFEGUARDS

## CORNERSTONE: INITIATING EVENTS

| **Cornerstone** | ***Initiating Events*** |
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| **General Description** | This cornerstone is designed to monitor the licensee's performance in controlling events that could progress to unwanted consequences involving the unauthorized disclosure, modification, loss, or theft of classified information or material. The frequency of such initiating events can be minimized by ensuring the capability, reliability and availability of controls and equipment, by ensuring that employees who are relied upon to perform security functions are adequately trained, and by implementing appropriate management measures. |
| **Objective and Scope** | To minimize initiating events that could have unwanted consequences potentially involving classified information or material. |
| **Key Attributes** | • **human performance:** can increase or decrease initiating events involving classified information and material.<br>• **equipment performance:** failure or degradation of site structures, systems, equipment and components can constitute an initiating event. The capability, availability and reliability of security equipment can be assured by sound preventive and corrective maintenance programs.<br>• **management measures:** effective management measures (e.g., proper classified information and material handling procedures and programs, employee training, audits and assessments) can minimize the frequency of initiating events. |
| **Items to Measure** | • **human performance:** human errors that cause initiating events can be measured by reviewing actuations of security equipment and failures to properly handle classified information and material.<br>• **equipment performance:** equipment failures that constitute initiating events can also be measured by reviewing actuations of security equipment and off-normal security conditions. Risk-informed inspections may be performed to check for possible degradation of engineered controls.<br>• **management measures:** management measures can best be measured by risk-informed inspections of procedures, corrective action programs, worker training programs, reporting mechanisms and other management oversight processes. |
| **Performance Indicators (PIs)** | • **actuation of security controls:** actuations that result from, for example, human errors, equipment failures, design deficiencies, or management measure failures.<br>• **off-normal conditions:** off-normal or abnormal conditions that do not result in actuation of a control (e.g., number of reportable events). |
| **Baseline Inspection Needs** | • **management measures:** technical adequacy of procedures, corrective action program, maintenance records, administrative and engineered controls for security equipment (e.g., availability, reliability, and configuration controls), security organization, and adequacy of security plans.<br>• **off-normal events:** review of off-normal events, licensee analysis, and corrective actions.<br>• **human performance:** training and qualification records; staff effectiveness in implementing programs and procedures.<br>• **accuracy of reported PI data:** verification of the collection of PI data and that data gathering is in compliance with NRC guidelines. |

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## PERFORMANCE AREA: CLASSIFIED INFORMATION AND MATERIAL SAFEGUARDS

## CORNERSTONE: SYSTEMS AND BARRIERS

| **Cornerstone** | ***Systems and Barriers*** |
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| **General Description** | This cornerstone is designed to address requirements for the protection and control of classified information and materials at HEU and Gaseous Diffusion Plant facilities. A licensee must be able to protect against internal and external threats. |
| **Objective and Scope** | To assure the operability (capability, availability, and reliability) of items relied on to protect against the unauthorized disclosure, modification, loss, or theft of classified information and material. |
| **Key Attributes** | • **engineered barriers**: the ability of systems, equipment and components to perform their intended functions can be assured through activities such as proper design and installation, maintenance, modification, calibration, and testing. Systems, equipment, and components of interest include: facility barriers; intrusion detection systems and alarms; and access control systems.<br>• **management measures:** sound management measures are important for assuring the capability, availability and reliability of security systems. Management measures of interest include: security equipment operating and maintenance procedures; administrative controls on classified information and material; maintenance programs; configuration control; employee training; and audits and assessments. |
| **Items to Measure** | • **engineered barriers:** availability, capability and reliability of security equipment such as facility barriers, intrusion detection systems and alarms, and access control and surveillance systems.<br>• **management measures:** areas that can be measured for this cornerstone attribute include training programs, physical protection procedures, corrective actions, reporting mechanisms, and human performance in fulfilling responsibilities for handling classified information and material. |
| **Performance Indicators (PIs)** | • **physical protection system:** availability of components of the physical protection system.<br>• **security force performance:** some quantitative measurement of the performance of security personnel (e.g. ingress/egress control, surveillance, intrusion detection, drill performance, etc.).<br>• **access control:** number of reportable events (e.g., ingress of unauthorized personnel or unauthorized disclosures of classified information or materials).<br>• **classified information protection:** instances of violation of safeguards or security systems, loss of cyber security provisions. |

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| **Baseline Inspection Needs** | • **physical protection**: operability and availability of intrusion detection systems, alarms and barriers (including containers and vaults for classified information and materials), performance of access detection and surveillance systems.<br>• **human performance:** training records, correction of training deficiencies, staff effectiveness in implementing programs and procedures.<br>• **classified information protection**: adequacy of procedures to test security systems, training programs for individuals handling classified information, results of performance assurance appraisals.<br>• **management measures**: adequacy of security plans and procedures, corrective actions, security organization, and reporting.<br>• **access authorization and control**: personnel screening, fitness-for-duty programs, and identification and/or inspection of personnel, packages, and vehicles entering and leaving the facility.<br>• **accuracy of reported PI data**: verification of the collection of PI data and that data gathering is in compliance with NRC guidelines. |

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## PERFORMANCE AREA: CLASSIFIED INFORMATION AND MATERIAL SAFEGUARDS

## CORNERSTONE: CONTINGENCY PREPAREDNESS

| **Cornerstone** | ***Contingency Preparedness*** |
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| **General Description** | This cornerstone is designed to assure that the licensee can implement adequate contingency measures in response to initiating events pertaining to classified information and material. Contingency preparedness incorporates both on-site licensee actions and supporting actions by off-site Federal, State, and local government authorities. |
| **Objective and Scope** | To ensure that the licensee is capable of implementing adequate contingency measures to respond to initiating events pertaining to classified information and material. |
| **Key Attributes** | • **response to events:** implementation of a protective strategy in response to an initiating event, including plans to get properly trained response personnel in place within pre-determined times.<br>• **human performance:** proper training of plant workers and security personnel to respond to the unauthorized disclosure, modification, loss, or theft of classified information or material; proficiency in training exercises and real events.<br>• **equipment:** response of security equipment to real or simulated initiating events.<br>• **management measures:** program audits and assessments, law enforcement liaison, employee training and qualification programs. |
| **Items to Measure** | • **response to events:** effectiveness of contingency response plans, readiness to respond to contingencies, protective strategy plan implementation, and event classification and notification.<br>• **human performance:** evaluation of structured drills and exercises.<br>• **equipment:** operability and performance of security response equipment.<br>• **management measures:** oversight of security plans. |
| **Performance Indicators (PIs)** | • **response to events**: success of periodic drills and exercises (e.g. employee participation).<br>• **equipment:** availability of contingency response equipment.<br>• **organization drill participation**: participation of security organization personnel in periodic drills and exercises and in actual events. |
| **Baseline Inspection Needs** | • **response to events**: protective strategy plan implementation, review of training and qualification records, protective strategy, drill and exercise scenarios, drill critiques, etc.<br>• **management measures:** security plans, review of corrective action program, and implementation of recommended actions.<br>• **human performance:** fulfillment of responsibilities in the event of an unauthorized disclosure, modification, loss, or theft of classified information or material.<br>• **accuracy of reported PI data**: verification of the collection of PI data and that data gathering is in compliance with NRC guidelines. |